Workzone Intersection Safety

It is a challenge to maintain safety and mobility at intersections in a work zone. For drivers unfamiliar with an intersection, a work zone can be a sudden, potentially dangerous surprise. For motorists who regularly drive through an intersection, a work zone can be a frustrating nuisance because of the way it adds to travel time. But the development and application of well-designed temporary traffic control plans can ensure safe mobility for both workers and drivers in an intersection work zone.

Overview

Work zones are highway and traffic engineering design challenges. The task of maintaining mobility and ensuring safety for workers, pedestrians, bicyclists and vehicle occupants is more demanding in work zones than on ordinary roads. The realignment of travel lanes and reduction of road capacity are often necessary to accomplish reconstruction or rehabilitation, such as pavement replacement, pavement patching, widening a street, utility work and reapplying pavement markings. All of these can cause delays and pose a threat to safety.

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Transportation agency coordination with transit, police, fire, emergency medical services, utilities, schools and railroads is a good idea (especially in urban areas) to alert these organizations to changes in road conditions. Suggesting alternate routes is time well spent to ensure safety and travel time reliability, particularly for school buses and emergency providers.

MUTCD, Part 6, Temporary Traffic Control

The *Manual on Uniform Traffic Control Devices* (MUTCD), contains the basic principles of design and use of traffic control devices for all streets and highways open to public travel, regardless of type or class, or the public agency having jurisdiction. The latest version of the MUTCD was adopted in December 2000. Part 6 of the 2000 MUTCD, "Temporary Traffic Control," contains the standards, guidance, options and support information related to work zones. Part 6 has been significantly revised and expanded with many "Typical Applications" detailed for a variety of street and highway work situations commonly encountered by road users. The MUTCD can be accessed at the following Web site: http://mutcd.fhwa.dot.gov.

Work sites should be regularly checked by qualified temporary traffic control personnel to ensure that the placement and operation of traffic control devices within work zones continue to conform with applicable plans. Cones or drums knocked out of alignment by an errant driver or a work vehicle, for example, could result in vehicles being channeled into oncoming traffic. The condition of devices should also be checked regularly to ensure that they continue to perform as intended. Modifications may also be necessary based on changing road conditions or work staging and progress.

Work Zone Intersection Safety Goals

Motorists entering and traveling through work zones must be provided with adequate time and distance to make decisions and stop when required. Drivers should never be forced to make unexpected stops or perform unanticipated steering or crash-evasion maneuvers when approaching or within a work zone.

Traffic congestion in intersections should be mitigated to the greatest extent possible. If long queues are expected or are occurring because of a work zone, additional advance traffic control devices may be necessary to provide users with information about lane choice or alternate routes before being trapped in a queue. Long delays often create impatient drivers who may change their usually good driving habits and take unnecessary risks that result in potential hazards to themselves and others. Pedestrians and bicyclists may ignore signs and walk against traffic signals if they are forced to wait too long to be accommodated in a work zone. This increases their vulnerability to vehicles whose drivers may also be frustrated.

Improving Work Zone Intersection Safety

Ensuring a high level of intersection safety in work zones depends on the use of the devices that offer dependable guidance. They must provide safe travel both day and night for vehicles diverted onto temporary paths. Warning, regulatory and/or guide signs in advance of and through the work zone advise motorists of specific hazards that may be encountered ahead.

Rather than closing and detouring traffic for intersection improvements, work crews will sometimes close one or more lanes to perform work activities. The factors that affect the choice to perform work under live traffic conditions may include ensuring access to local businesses and residences in the area and saving motorists from lengthy detours. In lane reduction situations, vehicles are funneled gradually into fewer travel lanes or onto temporary realignment paths with the use of high-visibility traffic control devices, such as drums, cones and barricades. These devices are often supplemented with advance arrow boards and portable, changeable message signs, particularly on higher volume and/or higher speed routes where advance warning is needed to guide traffic approaching the work zone.

Larger, brighter, or redundant devices supplemented with lighting may also be used to safely guide vehicles, pedestrians and bicyclists at intersection work zones. Where traffic must be intermittently slowed or stopped when approaching or within the work zone, flaggers are used to control and guide the users.

Pedestrians, Bicyclists and Workers at Intersections Within Work Zones

Pedestrian and bicycle safety at intersection work zones is often addressed by diverting them to other crossing locations to minimize potential hazards at the intersection. In these circumstances, pedestrians must be given adequate advance warning and guidance so they do not get to the closure and then have to backtrack to use the safer crossings. People who may be trapped because of inadequate advance guidance will often attempt to cross at the closed intersection or in mid-block, putting themselves at risk.

Bicyclists and pedestrians, especially persons with disabilities, should be provided with a safe and reasonable travel path that allows them to negotiate changes in terrain; they should never be forced into direct confrontations with traffic or operating work zone equipment. In some instances, where other travel paths are not readily available or reasonable, barriers may be used to protect pedestrians and bicyclists from potential collisions with road traffic or work equipment. Overhead protection may also be necessary where falling construction debris is a possibility.

The safety of workers in work zones, especially at intersections, is an overarching consideration for engineers, road construction firms and utility companies. Workers are especially vulnerable to collisions and, therefore, need to be highly visible to drivers. Worker safety can be improved by means of special clothing that is conspicuous to drivers at all hours and by extra lights for illuminating the intersection.

Resources

The FHWA developed the Best Practices Guidebook for Work Zone Safety to give state and local transportation agencies, construction contractors, transportation planners, trainers and others with interest in work zone operations, access to contacts and information about current best practices for achieving work zone mobility and safety. More information on this guidebook can be obtained on the following Web site: http://ops.fhwa.dot.gov/wz/wzguidbk/.